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मानक

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Mazdoor Kisan Shakti Sangathan

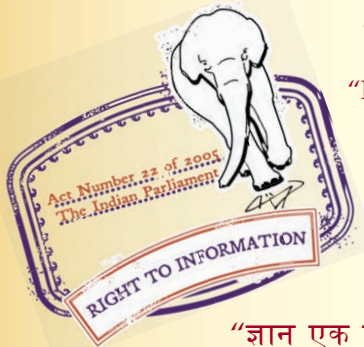
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“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 13867 (1993): Rubber standard temperatures, humidities and times for the conditioning and time interval between vulcanization and testing of test pieces [PCD 13: Rubber and Rubber Products]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

रबड़-वल्कनीकरण और परीक्षण टुकड़ों के परीक्षण करने के बीच अनुबन्धन और समय अन्तराल के लिए मानक तापमान, आर्द्रता और समय

Indian Standard

**RUBBER — STANDARD TEMPERATURES,
HUMIDITIES AND TIMES FOR THE
CONDITIONING AND TIME INTERVAL
BETWEEN VULCANIZATION AND TESTING
OF TEST PIECES**

UDC 678.4/ : 8 : C20.171

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FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Rubber Sectional Committee, had been approved by the Petroleum, Coal and Related Products Division Council.

The properties of rubber and behaviour of equipment under test are influenced by atmospheric conditions, such as the temperature, the relative humidity and the pressure of the ambient air at the time of the test. For comparison of test results obtained by different test laboratories/testing centres, it becomes necessary to specify standard atmospheric conditions and conditioning procedures, under which the test should be carried out or at which specimen should be conditioned before the test. The International Standard specifies two sets of conditions, namely;

- a) 50 percent relative humidity at 23°C, and
- b) 65 percent relative humidity at 27°C.

However, in this standard only second set of conditions, namely, 65 percent relative humidity at 27°C, suitable for tropical and sub-tropical zones has been prescribed.

In preparation of this standard assistance has been derived from ISO/DP 471.2 'Rubber—Standard temperatures, humidities, duration for the conditioning and time-interval between vulcanization and testing of test pieces', issued by International Organization for Standardization (ISO) (Revision of ISO 471 : 1983).

ISO/DP 471.2 combines the requirements given in ISO 1826 : 1981 'Rubber vulcanized — Time interval between vulcanization and testing'. Accordingly, the Indian Standard specifies the requirements for the time-interval to be observed between vulcanization and testing of rubber test pieces and products. Such requirements are necessary to assist in obtaining reproducible test results and to minimize disagreement between the customer and the supplier.

This standard takes cognizance of IS 196 : 1966 'Atmospheric conditions for testing'.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

RUBBER — STANDARD TEMPERATURES, HUMIDITIES AND TIMES FOR THE CONDITIONING AND TIME INTERVAL BETWEEN VULCANIZATION AND TESTING OF TEST PIECES

1 SCOPE

1.1 This standard prescribes the time, temperature and humidity conditions used for the conditioning and time-interval between vulcanization and testing of all types of rubber test pieces. Special conditions applicable to a particular climatic test or material or simulating a particular climatic environment, are not included.

1.2 The conditioning treatment required for each individual test should be stated in the relevant test method.

2 DEFINITION

For the purpose of this standard the following definition applies.

2.1 Conditioning

Exposure of rubber to specified relative humidity and/or temperature for stipulated period of time immediately before testing, in order to improve the reproducibility of test results.

3 TEMPERATURES AND HUMIDITIES TO BE USED

3.1 Standard Temperature

The standard temperature shall be 27°C.

3.2 Standard Humidity

If control of temperature and humidity are necessary, the standard humidity shall be 65 percent relative humidity at 27°C.

3.3 Other Conditions

3.3.1 When control of temperature and humidity is not necessary the prevailing ambient temperature and humidity shall be used.

3.3.2 Unless otherwise specified for technical reasons when a subnormal or an elevated temperature is necessary this temperature shall be selected from the following preferred values :

- a) -85, -70, -55, -40, -25, -10, 0°C
- b) 40, 55, 70, 85, 100, 125°C
- c) 150, 175, 200, 225, 250, 275, 300°C

3.4 Duration of Test

3.4.1 The period required to obtain any given degree of change in a test piece depends largely upon the type of rubber. Its composition and state of cure, and on the nature and severity of the test environment.

When an extensive investigation is required changes are usually monitored by sampling at set time intervals. For control purposes such a procedure is usually not necessary and a single exposure period may suffice.

In both cases it is recommended that the exposure period(s) be selected from the following preferred values :

- a) 8, 16 h;
- b) 24, 48, 72 h; and
- c) 168 h or multiples of 7 days.

4 TOLERANCES

4.1 Temperature

4.1.1 For the temperature specified in 3.1, the normal tolerance shall be $\pm 2^\circ\text{C}$. If a closer tolerance is required it shall be $\pm 1^\circ\text{C}$.

The average temperature of the environment shall be as close as practicable to the specified temperature.

4.1.2 For the temperatures specified in 3.3.2 (a) and 3.3.2 (c) the normal tolerance shall be $\pm 2^\circ\text{C}$, and for those specified in 3.3.2 (b) the normal tolerance shall be $\pm 1^\circ\text{C}$. In all cases the average temperature of the environment shall be as close as practicable to the specified temperature.

NOTE — Closer tolerance may be specified where it is shown necessary, in order to obtain reproducible test results.

4.2 Relative Humidity

For the relative humidity specified in 3.2, the normal tolerance shall be ± 5 percent relative humidity. If a closer tolerance is required, it shall be ± 2 percent relative humidity.

The average relative humidity of the environment shall be as close as practicable to the specified relative humidity.

4.3 Duration of Test (Tolerances)

4.3.1 For the test periods specified in 3.4.1 (a) the normal tolerance shall be ± 0.25 h.

4.3.2 For the test periods specified in 3.4.1 (b) the normal tolerance shall be $+ 0, - 2$ h.

4.3.3 For the test periods specified in 3.4.1 (c) the normal tolerance shall be ± 2 h.

4.3.4 In cases where, for technical reasons, test periods other than those specified in 3.4 and/or closer tolerances are necessary they shall be stated in the test method.

5 CONDITIONING

5.1 When the temperature and humidity specified in 3.1 and 3.2 is used, the standard time for conditioning shall be a period of not less than 16 h immediately before testing.

5.2 When the temperature as given in 3.1 is specified without the need to control humidity, the standard time for conditioning shall be a period of not less than 3 h immediately before testing.

5.3 When one of the temperatures as given in 3.3.2 is specified without the need to control humidity, the time for conditioning shall be a period sufficient for the rubber to reach temperature equilibrium with the environment, or for a period of time required by the specification covering the material or product being tested.

5.4 During the conditioning period the rubber test piece or product shall be positioned in such a manner that as far as possible the whole rubber surface is exposed.

6 TESTING

6.1 Unless otherwise specified, testing shall be carried out at the same temperature and humidity at which the conditioning was performed.

NOTE — Test pieces conditioned at the temperature and humidity specified in 3.1 and 3.2 may be tested, immediately after conditioning, at the ambient condition specified in 3.3.1 in cases where the resulting changes of temperature and moisture content do not affect the test results.

7 TIME INTERVAL BETWEEN VULCANIZATION AND TESTING

7.1 For all test purposes, the minimum time between vulcanization and testing shall be 16 h.

7.2 For non-product tests, the maximum time between vulcanization and testing shall be 4 weeks and for evaluation intended to be comparable, the tests, as far as possible, should be carried out after the same time-interval.

7.3 For product tests, whenever possible, the time between vulcanization and testing should not exceed 3 months. In other cases, tests shall be made within 2 months of the date of receipt of the product by the customer.

NOTE — These requirements relate only to the initial rubber material tests and product test both the initial and delivery stage. Special tests for other purposes may be carried out at any time, for example, to evaluate the influence of abnormal storage conditions on a product. In such instances this should be clearly stated in the test report.

8 TEST REPORT

The test report shall include the following information :

- a) Temperature, or temperature and relative humidity, used for conditioning;
- b) Tolerance on temperature and relative humidity used for conditioning;
- c) Duration of conditioning;
- d) Time-interval between vulcanization and testing;
- e) Temperature, or temperature and relative humidity, used for testing; and
- f) Tolerance on temperature and relative humidity, used for testing.

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Doc : No. PCD 14 (1060)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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